## **CLAIMS**

1 1	. A	filter	comprising a	ı pluralit	y of	interconnected	modular	basic units	, and	a dela	y line
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- equipped with takeoff points to furnish delayed sampling values (x1, ..., xN; xi) of a digital signal
- 3 (x), such that the delay times of the sampling values are integer multiples, and in particular even
- 4 integer multiples n of the period with n = 0, 1, 2, 3, ... of a sampling clock pulse coupled to the
- 5 digital signal (x),

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4

- each basic unit contains a programmable weighting device, a linkage device, and a delay
- device, which delays the data conducted to it by a single period (T) of the sampling clock pulse or
  - by a simple integer multiple thereof, and

the filter further contains a programmable control device, which switches over or switches

off a part, especially half, of the data inputs of the basic unit to achieve forward and/or backward

filtering and/or sign inversion and/or a change of the active filter length.

2. The filter of claim 1, characterized in that the programmable control device comprises a

first switching device, which, in dependence on a first control signal (F), couples a part, especially

half, of the data inputs of the interconnected modular basic units either to the delay line or to the

- interconnected modular basic units.
- 1 3. The filter of claim 1, characterized in that the programmable control device comprises a
- second switching device, which, in dependence on a second control signal (P), switches into an
- 3 ineffective state especially a last stage (N) of the delay line and/or a data input, especially the one

- 4 of the last stage (N) of the interconnected modular basic units.
- 1 4. The filter of claim 3, characterized in that the programmable control device comprises a
- sign inverter, which, in dependence on a third control signal (I), inverts the signs of the data
- 3 values passed through it, which are conducted to the associated data inputs of the interconnected
- 4 modular basic units.
- 1 5. The filter of claim 4, characterized in that the programmable weighting device comprises a
- 2 multiplier, to whose first input a coefficient (c) is conducted and to whose second input a data
- 3 value to be weighted is conducted, the coefficient (c) being programmable and being stored in a

register.

6. The filter of claim 5, characterized in that the linkage device comprises a first adder, whose

first and second input is coupled to a first and second data input of the basic unit, and whose

output is coupled to the second input of the multiplier.

7. The filter of claim 6, characterized in that the respective first data input of the modular

interconnected basic units are supplied with the delayed sampling values (x1, ..., xN) in sequential

- 3 time order, and the respective second data inputs are supplied essentially uniformly with a single
- data value, which is coupled to the delay line, when the first switching device is in a first switch
- 5 position (F1), and is coupled to at least one data output of the modular interconnected basic units,
- 6 when said first switching device is in a second switching position (F0).
- 1 8. The filter of claim 7, characterized in that the linkage device comprises a second adder,

- 2 whose first and second input are coupled to a third data input of the basic unit and to the output of
- the multiplier, and whose output is coupled to the input of the delay device, the third data input
- 4 being used to accept an output data value of the preceding basic unit, and the output of the delay
- 5 line being connected to a data output of the basic unit.
- 1 9. The filter of claim 8, characterized in that the registers of the modular interconnected basic
- 2 units are linked to one another like a shift register through a coefficient input and a coefficient
- output, so as to write the coefficients (c) serially into the registers.
  - 10. The filter of claim 9, characterized in that the number of existing functional units in the basic units, especially at the beginning and/or end of the modular interconnected basic units, is reduced, whereby modified basic units result.

- 17 -

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